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The genus *Dodonaea* (Sapindacae) in the Galápagos Islands

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The genus *Dodonata* P. Miller contains perhaps 60 species of shrubs and small trees, most of them occurring in Australia. The shrubby *Dodonaea viscosa* (Linnaeus) Jacquin and its varieties, however, are pantropical and pansubtropical in distribution, and several other species have been described from Java, the Hawaiian Islands, and Madagascar. A large number of varieties and forms have been described as well, most of them on rather trivial characters. In fact, the genus is badly in need of revision from a modern viewpoint.[1]

There are two varieties of *Dodonaea* present in the Galápagos Islands, differing from one another morphologically and ecologically. Both have at one time been considered as subspecific taxa of *Dodonaea eriocarpa* Bentham (Sherff, 1945, 1951), a species from the Hawaiian Islands questionably distinct from *D. viscosa.* However, comparison of collections from the Galápagos archipelago with a large number of others from around the world convinces me that they without doubt belong to the polymorphic and overdescribed *D. viscosa.* The main characteristic that has been used to separate *D. eriocarpa* from *D. viscosa* is the supposed presence of stellate trichomes in *D. eriocarpa.* But only simple, unbranched trichomes have been found on all pubescent specimens of the genus examined, including a number of collections from the Hawaiian Islands determined by others as belonging to *D. eriocarpa.*

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[1] For pertinent remarks regarding variation and the consequent taxonomic difficulties encountered in *Dodonaea viscosa,* see Brizicky (1963, pp. 476–477).

Dodonaea viscosa (Linnaeus) Jacquin, Enumeratio Systematica Plantarum, p. 19. 1760.[2]

Ptelea viscosa Linnaeus, Species Plantarum, vol. 1, p. 118, 1753.
Dodonaea viscosa var. *vulgaris* Bentham, Flora Australiensis, vol. 1, p. 476, 1863.

Shrubs or small trees 4–5 feet high, dotted with globular orangish sessile glands especially common on branchlets, petioles, and leaves; branches slender, dark ferruginous becoming gray, bark with numerous longitudinal cracks, becoming stringy; leaves simple, punctate-glandular, margins revolute; flowers bisexual, 4–5 mm. in diameter; stamens inserted at base of disc; anthers oblong, apex pubescent; ovary 3-lobed, pubescent, yellow-brown; style glabrous, dark brown; capsule 2–3-winged, punctate-glandular, wings papery, conspicuously veined, continuous from rounded apex to more truncate base.

Key to the Varieties of *Dodonaea viscosa* in the Galápagos Islands

1. Leaves viscid, green and shiny above, paler and slightly duller beneath, glabrous or midrib base tomentulose, oblanceolate or elliptical, entire to repand, apex acute to short-acuminate or obtuse, base attenuate to petiole, 34–55 mm. long, 8–16 mm. wide .... 1. *D. viscosa* var. *spatulata.*
1. Leaves more or less viscid, dark green or brown above and paler beneath, tomentulose, broadly elliptical to broadly oblong, entire, subapically obtuse and apex acuminate, base cuneate, 29–58 mm. long, 14–32 mm. wide .... 2. *D. viscosa* var. *galapagensis.*

1. **Dodonaea viscosa var. spatulata** (J. E. Smith *in* Rees) Bentham, Flora Australiensis, vol. 1, p. 476, 1863.

Dodonaea spatulata J. E. Smith *in* Rees, The Cyclopaedia, vol. 12, 1809.
Dodonaea eriocarpa var. *vaccinioides* Sherff, American Journal of Botany, vol. 32, p. 210, 1945.
Dodonaea viscosa var. *arborescens* f. *spatulata* (J. E. Smith *in* Rees) Sherff, *op. cit.*, vol. 32, p. 214, 1945.

Branchlets more or less tomentulose; inflorescences terminal or axillary, glabrous except for pedicels; pedicels glandular, tomentulose, 3–6 mm. long in flower, 6–8 mm. long in fruit; sepals 3–4, narrowly to broadly oblong, obtuse, apex and margins puberulent, concave, 2.5–3 mm. long, 1–1.5 mm. wide, a little longer than stamens, becoming reflexed, more or less persistent; stamens 6–8, twice as many as sepals, becoming reflexed; anthers 2 mm. long; ovary 1–2 mm. high; style twisted, 3–5 mm. long; capsule straw-colored to purplish, pubescence masked by viscid exudate, 8–13 mm. high, 10–18 mm. wide, including wings.

Specimens examined. Isla Isabela: southern part, *Baur 63* (GH); Cowley Bay, *Baur 62* (GH), low bushes in disintegrated pumice near shore, *Stewart 1943* (CAS, GH); Punta Alfaro, lower part, arid terrain, *Snow 482* (DS); Villamil, occasional bushes on lava beds below 100 feet, *Stewart 1942* (GH, holotype of *D. eriocarpa* var. *vaccinioides*; DS, holotype photograph; CAS, isotype). Isla Fernandina: southwest side, growing in lava with cacti in very severe circumstances, about 200 meters, *Wiens 3831* (DS). Isla San Salvador: James Bay, occasional bushes 4–5 feet high on basaltic lava, 850 feet, *Stewart 1944* (CAS, GH).

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[2] This abbreviated description applies to the species only as it occurs in the Galápagos Islands. Citation of the complete synonymy for this taxon must await a rational revision of the genus.

This variety is widespread and pantropical in distribution, being found more or less throughout the range of the species. It is indigenous in the Galápagos Islands, and was reported from the archipelago simply as *Dodonaea viscosa* by Robinson (1902) and Stewart (1911). Degener and Degener (1956) were the first to imply that *Dodonaea eriocarpa* var. *vaccinioides*, described as a Galápagos endemic (Sherff, 1945) and later claimed to be of occurrence in the Hawaiian Islands (Sherff, 1951), might actually fall under the range of variation exhibited by *D. viscosa* var. *spatulata*.

2. **Dodonaea viscosa** var. **galapagensis** (Sherff) Porter, *comb. et stat. nov.* basionym: *Dodonaea eriocarpa* var. *obtusior* f. *galapagensis* Sherff, American Journal of Botany, vol. 32, p. 207, 1945.

Branchlets tomentulose; inflorescences terminal, tomentose throughout; pedicels 3–4 mm. long in flower, longer in fruit; sepals 4, broadly ovate, obtuse or acute, tomentose, concave, about 3 mm. long and 2 mm. wide, a little shorter than stamens; stamens 8–9; anthers 2.5 mm. long; ovary 1.5–2.5 mm. high; style furrowed, not twisted, 2–3 mm. long, 3-lobed; capsule straw-colored, pubescent, 12–16 mm. high, 18 mm. wide, including wings.

SPECIMENS EXAMINED. Isla Isabela: Cowley Bay, small trees and shrubs around 1800 feet, *Stewart 1946* (CAS, GH); Tagus Cove, bushes 4–5 feet high, abundant on lava beds above 2000 feet, *Stewart 1945* (GH, holotype of *D. eriocarpa* var. *obtusior* f. *galapagensis*; DS, holotype photograph; CAS, isotype), 2100 feet or less, *Snodgrass & Heller 904* (GH), 4000 feet, *Snodgrass & Heller 876* (DS, GH); mountain east of Tagus Cove, 3000 feet, *Snodgrass & Heller 244* (GH); Tagus Cove Mountain, *Howell 9543* (CAS).

This endemic variety was reported from the Galápagos Islands as *Dodonaea viscosa* var. *spatulata* by Robinson (1902) and Stewart (1911).

As the lists of cited specimens indicate, *Dodonaea viscosa* var. *spatulata* has been collected in the arid zones of Isla Isabela, Isla Fernandina, and Isla San Salvador from near sea-level to an elevation of 850 feet. *Dodonaea viscosa* var. *galapagensis*, on the other hand, has been found only on Isla Isabela in a presumably less extreme and more mesic environment from elevations of 1800 to 4000 feet. The two varieties are probably found elsewhere in the archipelago, this distribution reflecting our paucity of collections from the islands.

The presence of correlated altitudinal and morphological differences within *Dodonaea viscosa* as found in the Galápagos Islands is paralleled by the same species in Java (Adelbert, 1948; van Steenis, 1949, 1965; Backer and Bakhuizen van den Brink, 1965). In Java the coastal populations are glabrous, while those at higher elevations [1100 to 3300 meters according to van Steenis (1949)] are pubescent. Likewise, there is a distributional gap between them. They also differ in leaf shape, but this difference is not the same as that found between *D. viscosa* var. *spatulata* and *D. viscosa* var. *galapagensis*. The coastal Javanese populations have obovate-spatulate leaves (and bisexual flowers), the mountain populations elongate-lanceolate leaves (and bisexual or unisexual flowers) (Adelbert, 1948; Backer and Bakhuizen van den Brinck, 1965). Standley and Steyermark (1949) have reported that in Guatemala *D. viscosa* is found in separate coastal and mountain populations, but they were unable to find any morphological differences between them.

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Dr. Ira L. Wiggins and Mr. John Thomas Howell have kindly read the manuscript, and Dr. Wiggins has also provided his notes on Galápagos Islands material of *Dodonaea* examined by him at the Gray Herbarium, Harvard University. I am grateful to them both for their comments and encouragement. Research for this study was carried out under National Science Foundation grant GB-5254, administered by the California Academy of Sciences.

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